New Features in AMGA 2.0

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Enabling Grids for E-sciencE

What is AMGA ? (ARDA Metadata Grid Application)

- **Started as a prototype to evaluate the Metadata Interface**
  - Evaluated by communities since the beginning:
  - Matured quickly thanks to users feedback

- **Metadata Catalogue of EGEE's gLite Middleware**

- **Requirements from HEP community**
  - Millions of files, 6000+ users, 200+ computing centres
  - Mainly (real-only) file metadata
  - **Main concerns : scalability, performance, fault-tolerance, Support for Hierarchical Collection**

- **Requirements from Biomed community**
  - Smaller scale than HEP
  - **Main concerns : Security**

AMGA 2.0 Release : 2009. 09. 17

- **WS-DAIR (SOAP) front-end**
  - Allows AMGA a seamless integration into the OGF standardized Grid Data Access Services

- **Security Features**
  - Sticky bit support
  - Dynamic mapping from VOMS Role/Group to AMGA user/group
  - Entry level ACLs & permission checks in Native SQL Query

- **Support for run-time configurable AMGA server**
  - Multi-Process model
  - Multi-threaded & Multi-Process Model with connection pooling

- **Native SQL Query Support for Oracle**

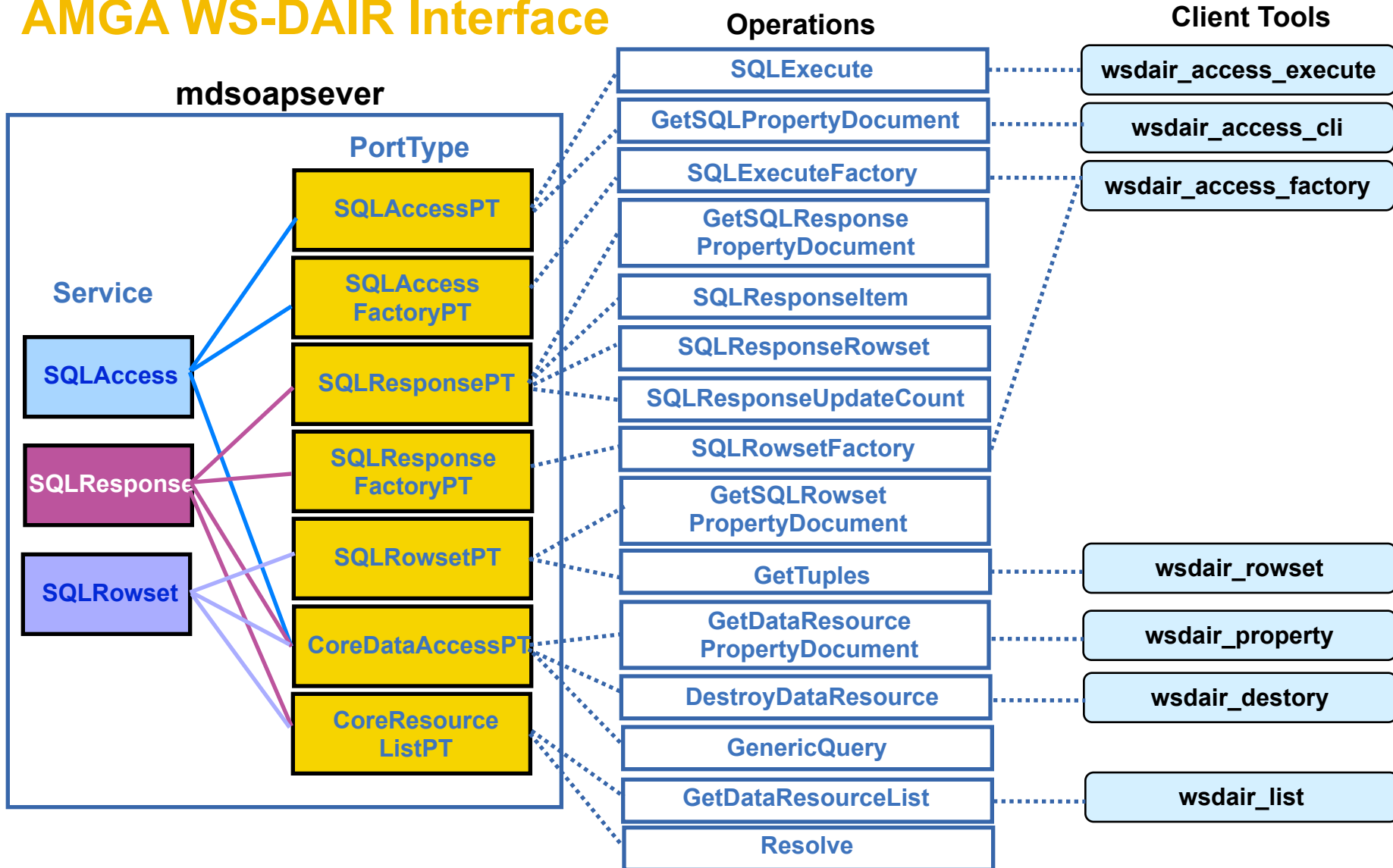- **Lots of other features and bug fixes requested by user community**

Enabling Grids for E-sciencE

AMGA WS-DAIR (SOAP) Front-end

- **WS-DAIR: Web Service Data Access and Integration - The Relational Realization (http://www.ogf.org/documents/GFD.76.pdf)**

- **Greatly improve the extensibility and interoperability with other Data access services**

- **Full use of the advanced security features of AMGA, namely schema ACLs and access through the GSI and VOMS.**

- **Interoperability : Reference Implementation of OGF WS-DAIR**
    - Participate in the "Experimental documentation" of WS-DAI & WS-DAIR Implementation
    - Document: http://forge.gridforum.org/sf/go/doc15667?nav=1
    - **Interoperable with the OGSA-DAI WS-DAIR implementation**

WS-DAIR Interoperability Testing

- **"WS-DAI and WS-DAIR Implementations - Experience Document"**
  - Defines 18 mandatory, 16 optional test cases for interoperability testing
  - publish a test suite based on SoapUI
  - **AMGA passed all 18 mandatory test cases**

- **Interoperability Test against OGSA-DAI WS-DAIR implementation**
  - OGSA-DAI WS-DAIR Client → AMGA WS-DAIR Server [OK]
  - AMGA WS-DAIR Client → OGSA-DAI WS-DAIR Server [OK]
  - Soap UI Client → AMGA WS-DAIR Server [OK]
  - https://forge.gridforum.org/sf/wiki/do/viewAttachment/projects.dais-wg/wiki/IssuesWithTheWSDAIRProposedRecommendation

AMGA WS-DAIR Interface

mdsoapsever

Service

PortType

Operations

Client Tools

- SQLAccess
- SQLResponse
- SQLRowset

- SQLAccessPT
- SQLAccess FactoryPT
- SQLResponsePT
- SQLResponse FactoryPT
- SQLRowsetPT
- CoreDataAccessPT
- CoreResource ListPT

- SQLExecute
- GetSQLPropertyDocument
- SQLExecuteFactory
- GetSQLResponse PropertyDocument
- SQLResponseItem
- SQLResponseRowset
- SQLResponseUpdateCount
- SQLRowsetFactory
- GetSQLRowset PropertyDocument
- GetTuples
- GetDataResource PropertyDocument
- DestroyDataResource
- GenericQuery
- GetDataResourceList
- Resolve

- wsdair_access_execute
- wsdair_access_cli
- wsdair_access_factory
- wsdair_rowset
- wsdair_property
- wsdair_destory
- wsdair_list

AMGA WS-DAIR Performance Study : Throughput

- **Testing Environment (Direct Data Access)**
  - DB : the simulation table used for the WISDOM project
  - One row with two attributes was retrieved by each query
- **Results**
  - Little difference between TCP streaming and WS-DAIR SOAP
  - Maximum Throughput : about 1,400 queries / sec

Enhanced Security features
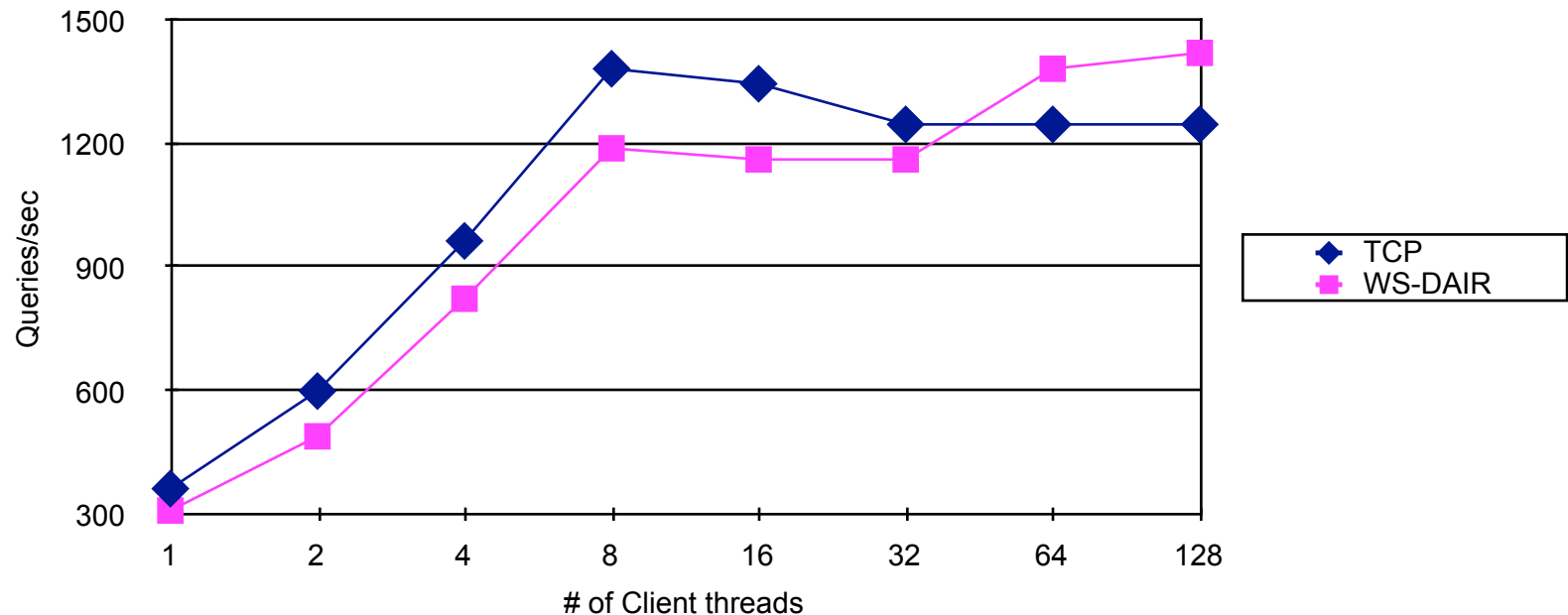
Enhanced Security Features

- **<u>Sticky Bit</u> :** When set, entries inside that collection can be renamed or deleted only by the entry's owner, or superuser

    Query>   chmod /test   rwt

- **<u>VOMS Role and Group mapping at runtime</u>**
    - The user is granted with that specific AMGA user/group if the user's proxy contain the mapped VOMS Role/Group

        Query> user_voms_add gemma /gilda/Role=gemmaAdmin

        Query> user_voms_list

        Query> user_voms_delete   /gilda/Role=gemmaAdmin

- **<u>Entry level ACLs & Permission checks in Native SQL Query</u>**

**Enabling Grids for E-sciencE**

Native SQL Query support for Oracle

- **For Native SQL Query, AMGA supports**
  - **SQL 92 entry level <direct data access statements>**
    - SELECT, UPDATE, INSERT, DELETE
  - **Some SQL 92 intermediate level statements and others**
    - LIMIT, OFFSET, and JOIN
  - **Advanced security features, namely schema ACLs and access through the GSI and VOMS.**

- **At 1.9, Native SQL Query was enabled for PostgreSQL, and MySQL only**

- **As of 2.0, Oracle is also supported**

Multi-threaded Multi-process Model

• **Either previous multi-process model or new multi-threaded & multi-process model can be selected when starting a service**

• **New multi-threaded & multi-process model**

– Allows far more concurrent client connection at the same level of service stability as the old multi-process solution

– DB connections shared among threads

Enabling Grids for E-sciencE
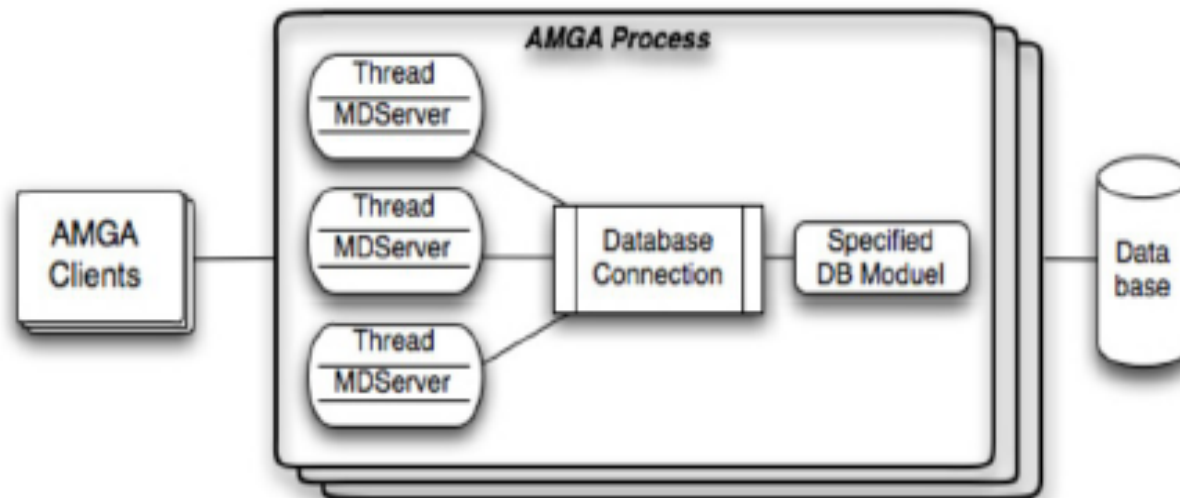
- **AMGA Support Forum (help, features request, bugs):**
  - http://amga.ct.infn.it/amga

- **AMGA Mailing-list:**
  - support-amga@cern.ch

- **AMGA Developers Mailing list**
  - amga-developers@cern.ch

- **AMGA Homepage**
  - http://cern.ch/amga

- **AMGA 2.0 Downloads (SLC4/5 32bit/64bit):**
  - http://cern.ch/amga/downloads/2.0/

Thank you for your attention

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